is determined by the distance between the adjusting nut **49***c*, and the top load spreading, and compression washer **60**.

In practice, the amount of precompression of the springs is determined such that the upward vertical deflection of the isolation spring **56**, as the spring unloads due to the cyclic dynamic forces superimposed on its static deflection by the operating vibratory equipment, is of an amount to always allow some precompression to exist. Finally, the fourth fastening nut **49***d* is tightened against the top of the bale frame **50**, to lock the isolation spring assembly in place after it has been adjusted to the desired precompression height.

The elastomer protective boot **64**, shown placed over the steel coil isolation spring **56**, is primarily used to reduce any clicking noise that may occur between the top coil of the isolation spring **56**, and the bottom load spreading-compression washer **60**. This clickingn lose can occur as the spring loads and unloads during operation, and which may cause some relative rocking or sliding motion between these parts. The elastomer protective boot **64** may be omitted if no objectionable clicking noise is present.

The centering pins **66** can be seen inserted into the bale weight **52**, to locate the isolation spring **56** in the center of the bale. While FIG. **6** implies the use of four centering pins **66** (one at each 90° around a circumference of the coil spring **56**), two or three pins may also be used.

The suspension cable segment **42** passes up through the hole in the center of the bale weight **52** and is connected to the bottom of the upper threaded metal ferrule **47**, which in turn, passes through the bottom load spreading-compression washer **60**. The cable segment **42** is held in place by a fastening nut **70***a* on a top side of the bottom compression washer **60**. A second fastening nut (not shown), may be placed on the upper threaded metal ferrule **47**, and tightened to the underside of the bottom compression washer **60**, to make a more secure connection if required. The function of the bale weight **52** is to lower the natural frequency of the horizontal bending mode of the hanger component **20**, such that it is well away from the operating frequency of the vibratory equipment, to prevent unwanted motion or whipping of the cables.

The spring rate of the isolation spring **56** is selected such that the static weight of the vibratory equipment causes the isolation spring **56** to compress by a deflection of between 0.75 inches and 1.5 inches. With spring rates of the static isolation spring **56** within this range, the vertical superimposed dynamic forces from the operating vibratory equipment are absorbed in deflecting the isolation spring **56**, such that only minimal force is transmitted to the support structure. Likewise, dynamic horizontal force components are absorbed by the pendular deflection of the isolation cable assembly. The donut-shaped elastomer damper spring **54** prevents unwanted motion of the isolation spring **56** due to the vibratory equipment's operating frequency being close to any of the natural frequencies of the bending modes of the isolation spring **56**, by applying an opposing load to any such motion. Of particular importance is the fact that the vertical spring rate of the isolation spring **56** is virtually unaffected by the application of the elastomer damper spring **17**, thus maintaining its vertical isolation efficiency.

Since adjusting the position of the adjusting nut **49***c* on the threaded metal ferrule **46** also raises or lowers the bale height, it provides a convenient means to make fine height adjustments, that can be used to accurately level the vibrating equipment during the equipment installation process.

As illustrated in FIGS. **4**, **5**, and **7** the invention can also be applied to a base mounted isolation system. In the description of this alternate embodiment, like elements carry like indicator numerals as to the previous embodiment.

The wire rope segment **42** is connected between the threaded metal ferrules **47**, **48** such that the metal ferrules **47**, **48** are connected to each end of the wire rope segment **42** by swaging the wire rope into the ferrule, or by other suitable means. The adjusting and fastening nuts **70***a, b, c* are used on the threaded metal ferrules **47**, **48** to connect the wire rope segment **42** between a top of a load spreading washer **61** and a bottom of an inverted conveyor isolation connecting bracket **72**. An alternate damper spring **74** is used which surrounds the isolation spring **56**. The damper element **74** comprises a cylinder-shaped elastomeric block. The damper element **74** is arranged to be compressed in a parallel spring circuit, with the isolation spring **56**, by the washer **61**. The damper element **74** opposes excessive amplitudes of the isolation spring, by opposing a compression of the isolation spring **56**.

The pins **66** can be located within an inside circumference of the isolation spring **56** to guide and locate the spring **56**. Alternately, the damper element **74** can be located inside the spring **56** and the pins located outside the spacing **56**.

A floor stand **75** includes a formed metal mounting plate **76**, a formed metal column wall **78**, and the base mounting plate **80**, assembled together by welding. The formed metal mounting plate **76** provides a support means for the elastomer damper element **74** and the isolation spring **56**. The pins **66** are carried by the mounting plate **76**. The formed metal column wall **78** may be of any reasonable height that is determined solely by deflection considerations due to the natural frequencies of the column, and by the installation requirements for the conveyor application. Holes in a base mounting plate **80** provide means to lag the floor stand **75** to a support foundation such as a concrete floor, or a steel structure.

To accommodate the base mounted isolation systems **22**, the conveyor isolation connecting brackets **72** are inverted and, in the case of the illustrated vibratory conveyor, bolted to the wing plate assemblies **30** or to isolation system mounting plates similar to **33**.

The housing formed by the bale frame **50** and bale weight **52** is not required for the support component **22** as the isolation spreading assembly is mounted directly on the floor stand assembly **75**, which is securely fastened to a floor structure of some type and is not free to move about when the vibratory equipment is in operation.

From the foregoing, it will be observed that numerous modifications and variations can be effected without departing from the true spirit and scope of the novel concept of the present invention. It is to be understood that no limitation with respect to the specific embodiment illustrated herein is intended or should be inferred. The disclosure is intended to cover, by the appended claims, all such modifications as fall within the scope of the claims.

What is claimed is:

1. A vibration isolation component for connecting a vibrating structure to a relatively non-vibrating structure comprising:

a spring having a first end and a second end, said spring being compressible and expandable along an axis between said first and second ends, said spring arranged to support the vibrating structure from the non-vibrating structure; and

a damper element arranged adjacent one of said first or second ends and arranged to impart a resilient force opposing expansion of said spring, and to impart a